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ENDANGERED SPECIES TECHNICAL BULLETIN

Department of the Interior • U.S. Fish and Wildlife Service • Endangered Species Program, Washington, D.C. 20240

Amended Regulations Proposed To Allow More Cooperative Pacts With States

The Service has proposed revised regulations to carry out a change in the Endangered Species Act of 1973 that is designed to facilitate the participation of more states in the cooperative agreement program.

The proposal (F.R. 8/30/78) concerns the alternative set of eligibility requirements provided for under an amendment to section 6 of the law and signed by President Carter on December 19, 1977. These alternate requirements may be applied by any state possessing authority for the management of some, but not all, federally listed species resident in the state to enter into a cooperative agreement with the Service and receive Federal grant-in-aid funds for its endangered species program.

For example, a state fish and wildlife conservation agency may have authority to protect only certain categories of federally listed species, such as vertebrates, rather than all listed resident species (which could include insects, mollusks, or other invertebrates). Under the original law, the agency could not meet the requirements of section 6, which specified that state agencies must have authority to conserve *all* federally listed Endangered or Threatened species.

As provided in the amendment, a state may now be considered eligible for cooperative agreements if it satisfies paragraphs 3, 4, and 5 under the existing section 6(c), and if it also has plans to give immediate attention to federally listed species that the Service and state agency agree are "most urgently in need of conservation programs. . . ." (Paragraphs 3, 4, and 5 require the states to have authority to investigate the status of resident wildlife, acquire habitat, and provide for public participation in the listing of resident species if they have a listing function.)

In its new proposal, the Service has proposed the following criteria for determining which listed species are most urgently in need of a conservation program:

1. The degree of threat to the continued existence of the species.
2. The species' recovery potential.
3. The taxonomic status (e.g., giving full species priority over subspecies or populations).
4. Such other relevant biological factors as determined appropriate.

The proposal also provides for appropriate rewording of all existing regulations pertaining to cooperative agreement eligibility and responsibilities to bring the regulations into line with the amendment. States that already have broad authority and wish to conserve all federally listed resident species may still do so and will remain eligible for cooperative agreements now in force.

To further improve program administration, the Service also is proposing to allocate Federal grant-in-aid funds on a semiannual basis. This would replace the present system of allotting funds only once a year.

Comments on this proposal from the public and Governors of all states are due by October 20, 1978.

Critical Habitat Set For Two California Plants

A 60-acre remnant of the Antioch Dunes in Contra Costa County, California, has been designated as Critical Habitat for two Endangered plants—the Contra Costa wallflower (*Erysimum capitatum* var. *angustatum*) and the Antioch Dunes evening primrose (*Oenothera deltoides* ssp. *howellii*)—in a final rulemaking issued by the Service (F.R. 8/31/78).

The ruling, effective October 1, 1978, will benefit other species of plants and insects, including the Endangered Lange's metal mark butterfly (*Apodemia normo langei*), that also reside in the dunes. In its larval stage, Lange's metal mark feeds solely upon wild buckwheat (*Eriogonum latifolium auriculatum)* growing on the dunes. A Critical Habitat determination for the butterfly is pending.

The dunes formerly covered 500 acres, extending for about 3 miles parallel to the Sacramento–San Joaquin Rivers and averaging one-quarter mile in width. Much of the dunes have disappeared because of sand mining and rototilling for fire control. Both the wallflower and evening primrose require areas that have not been invaded by weedy exotic plants, and the primrose in particular can thrive only in open sands. (continued on page 9)

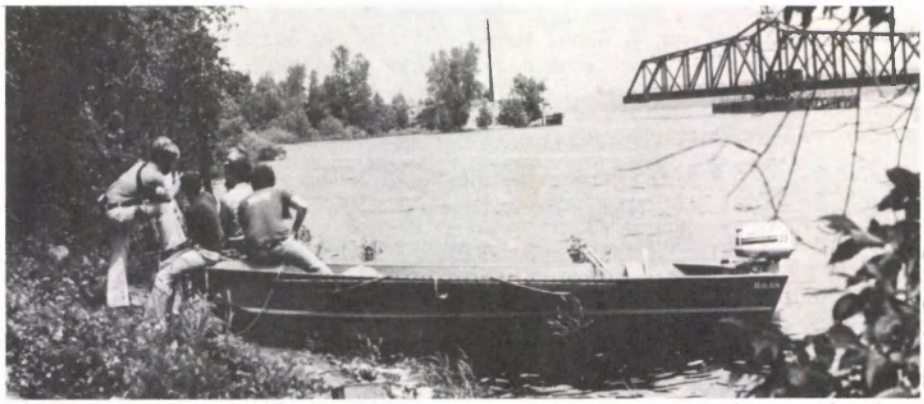
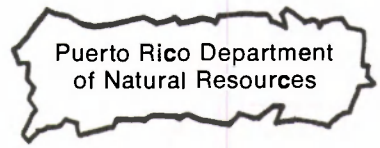


Photo by Dona Finnley

Members of a Corps of Engineers survey crew and the Service confer near the place where Endangered Higgins' eye pearly mussels have been found. (See story on page 3.)

Special Report

Puerto Rico Expands ES Protection Program



A new ranger corps has been enlarged by Puerto Rico's Department of Natural Resources to enforce strengthened wildlife regulations and promote the protection of endangered species.

Created in 1977 with 80 rangers sworn into service, the corps recently was doubled in size by the assignment of 84 more rangers to the department's district offices. The corps was authorized by the enactment in 1976 of a new wildlife law by the Commonwealth's legislature.

This law also provides for new hunting regulations that specifically protect endangered amphibians and reptiles—species previously lacking protection under Commonwealth law.

Ranger Patrols

Part of the ranger force has been stationed on Mona and Culebra islands, which are under Commonwealth jurisdiction. The rangers are patrolling the beaches to protect nesting Endangered hawksbill (*Eretmochelys inbricata*) and leatherback (*Dermochelys coriacea*) sea turtles from any human depredation of eggs and nesting females. The rangers also are controlling recreational usage of Mona island to protect the Threatened Mona ground iguana (*Cyclura stejnegeri*). The iguana nests in the lowlands, which have become prime areas for campsites and vehicular traffic.

Hunting Restrictions

To reduce the impact of hunting on federally listed Endangered species, the department has created a buffer zone around the habitat of the Puerto Rican parrot (*Amazona vittata vittata*) that is closed to the shooting of pigeons and doves. All hunting has been prohibited in the habitat of the Puerto Rican plain pigeon (*Columba inornata wetmorei*).

In addition, hunting has been closed for three species of waterfowl listed as endangered by Puerto Rico—the Bahama pintail (*Anas bahamensis bahamensis*), the ruddy duck (*Oxyura jamaicensis*), and the purple gallinule (*Porphyrula martinica*).

Federal Aid

The department, established in 1973, has been employing Federal Aid in Wildlife Restoration (Pittman-Robertson) funds for endangered wildlife planning, research, and management. Currently, it is progressing toward compliance with the requirements for a cooperative agreement with the Service to receive Federal grant-in-aid matching funds for endangered species conservation.

Endangered species "watchlists" for both animals and plants have recently been completed with the assistance of other Commonwealth and private organizations. The lists are used by the department in setting priorities for management and research.

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Regional Briefs

Endangered Species Program regional staffs have reported the following recent activities in their areas:

Region 2. The regional office reports that the status review of the Houston toad in Harris County, Texas, has been received. According to the study, no specimens were found, despite an intensive search for both adult and young toads.

Region 3. A booklet entitled "Bald Eagle Production in the Great Lakes States 1973–77" has been developed by Carl Madsen. Copies may be obtained by writing to the Twin Cities regional office.

Region 4. Final arrangements have been made to award contracts for status reports on 104 plant species within the region. These contracts have been designed to include surveys of five national wildlife refuges, as well as to provide information for the management of any candidate species that may be present.

Region 5. Contracts have been awarded for undertaking status reviews of the endangered flora of Pennsylvania, West Virginia, and Delaware.

Corps/Service Cooperate To Protect Endangered Mussels

One evening in early August, Jim Engel found a message awaiting him at home to call Sam Fuller at once, no matter how late the hour. Engel, the U.S. Fish and Wildlife Service's Region 3 endangered species specialist based at Minneapolis–St. Paul, imagined what the call was about before he picked up the telephone. There had been other urgent calls like this one from Fuller—all concerning new finds of endangered mussel specimens in the upper Mississippi River system. A malacologist with the Academy of Natural Sciences of Philadelphia (ANSP), Fuller has been surveying portions of the river's navigational channel scheduled for dredging by the U.S. Army Corps of Engineers. Under a unique contingency plan agreed to by the Corps and the Service, Fuller has instructions to call Engel and Corps officials as soon as endangered mussels are located, so that measures can be taken to protect them from the dredges.

On this occasion, Fuller informed Engel that he had found five Endangered Higgins' eye pearly mussels (*Lampsilis higginsi*) in the St. Croix River near the Hudson (Wisconsin) railroad bridge (about 25 miles upstream from where the St. Croix joins the Mississippi). The five specimens had been taken from a pool not far from where Fuller's crew discovered two other Higgins' eyes in 1977.

Under the contingency plan, dredging scheduled for this site would be temporarily stayed to prevent the imminent destruction of protected mussels while permitting an evaluation of the effects of dredging and the consideration of available alternatives.

In Effect Since 1977

Essentially, the agreement is an interim approach to promoting Corps compliance with Section 7 of the Endangered Species Act of 1973—a provision that requires all Federal agencies to insure that their actions do not jeopardize Endangered or Threatened species or destroy or modify habitats considered to be critical to the species' continued existence.

In effect since the culmination of the survey in June 1977, the contingency plan is representative of the Corps' comprehensive effort to study Endangered mussels of the upper Mississippi to insure that channel maintenance will not have an adverse impact on any listed species or subspecies.

Jack Hemphill, former Twin Cities regional director for the Service, considers the actions of the Corps' St. Paul District since initiating consultation in January 1977 as exemplary: "In view of the potential ramifications this particular consultation presented, and the results accruing from the cooperative effort, I believe this consultation should serve as a model of how section 7 of the act should be administered."

The Corps of Engineers has been dredging the upper Mississippi to maintain a 9-foot navigational channel for over 50 years. Estimates put last year's river traffic in commercial cargo in the district at nearly 20 million tons, both up- and down-bound. During its 220-day navigational season, the Corps dredges an average of 6 percent of the 284 river miles in its St. Paul District. Some 20 sites must be dredged either annually or every other year to clear a path for the continuous flow of such commodities as coal and grain, commonly shipped by barge.

Source of Controversy

In 1976, a few months after the Higgins' eye and fat pocketbook (*Proptera capax*) pearly mussels were listed by the Service as Endangered (F.R. 6/14/76), a private citizen complained that the Corps' dredges had killed a Higgins' eye in the Mississippi River's east channel at Prairie du Chien, Wisconsin. She charged the agency with violating section 7.

Prior to the complaint, and even prior to the final listing of the species, the Corps had met with the Service, local government officials, and concerned citizens to notify them of its intent to dredge the channel and to discuss possible impacts. The Great River Environmental Action Team (GREAT), an interagency group of Federal and state representatives (see accompanying story), consulted commercial clammers to determine locations of clam beds and, in July 1976, visited the sites. This resulted in a modification of the dredging design to reduce the possibility of damage to known or suspected clam beds.

Following its review of the proposed operations, the Service determined that reasonable precautions were being taken by the Corps to insure that endangered mussels would not be jeopardized.

Study Launched

But the incident showed that knowledge of the status and distribution of the Higgins' eye was very limited, as was information on the abundance, distribution, and ecological requirements of the other 48 mussel species and subspecies known in the upper Mississippi. Accordingly, in keeping

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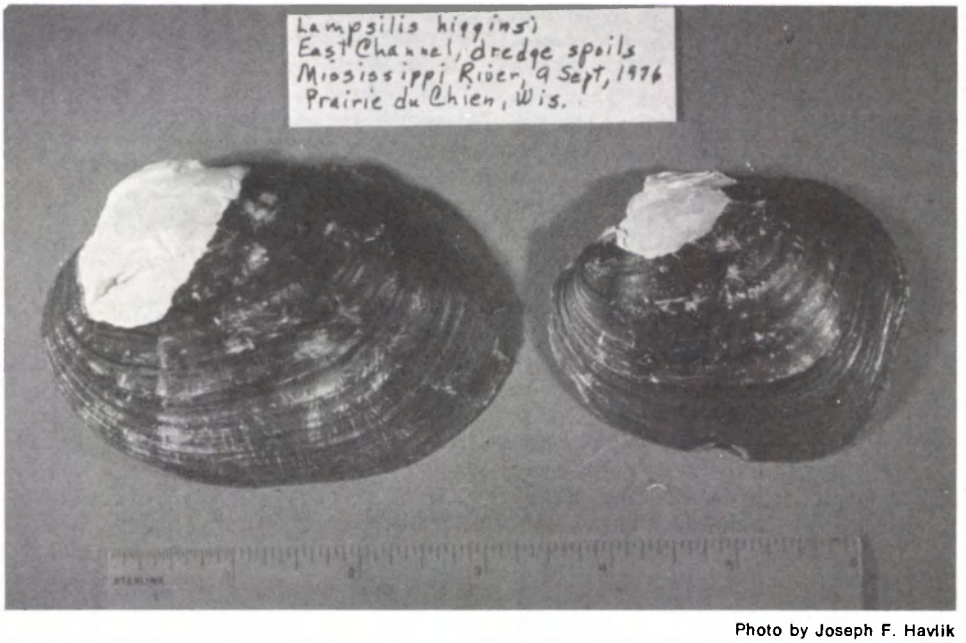

Photo by Joseph F. Havlik

These Higgins' eye specimens—chipped from a dredge pipe in the Mississippi River's east channel near Prairie du Chien —prompted Marian Havlik to charge the Corps of Engineers with a Section 7 violation

Mussels (continued from page 3)

with its section 7 responsibilities—and as a key member of the GREAT seeking to restore the river's multiple wildlife and recreational resources—the Corps decided to undertake a comprehensive study of freshwater mussel ecology to determine the effects of dredging and channel maintenance.

The need for the study was further underscored by a threshold examination conducted in February 1977 by the Service (following the initiation of formal consultation by the Corps), which concluded that:

- Maintenance dredging may jeopardize the continued existence of the species and/or adversely modify the habitat that may be determined critical to the species.
- Sufficient information did not exist at the time to determine Critical Habitat for the species.
- To make a biological judgment as to whether or not maintenance dredging would modify the Critical Habitat, it would be necessary to determine the location and extent of existing clam beds. Further, to determine whether maintenance dredging has jeopardized the continued existence of a species, it would be necessary to understand the effects of siltation on mollusks.

Dredging Effects "Minor"

The independent 2-year study effort —designed with the assistance of the Service, the States of Wisconsin and Minnesota, and the ANSP—was started in mid-July 1977 by Fuller, a recognized authority on mussels, under a contract with the Corps. Working through mid-November, Fuller surveyed 46 sites that had a history of dredging or were scheduled for dredging, including 42 sites on the upper Mississippi, 3 on the Minnesota River, and 1 on the St. Croix River, with cursory examination of a dozen additional locations.

At each sampling site, observations were made on its physical and biological condition, on the nature of the mussel community, and on the possible effects of channel maintenance.

After the first year of study, Investigators tentatively concluded that channel dredging and associated activities "have only a minor impact on freshwater mussels, including the legally protected species" and that with careful planning the impact could continue to be minor. For example, Fuller noted that the two Higgins' eye specimens found in the St. Croix River during the study were only a few meters from where the navigational channel had been dredged in 1970, yet both were old enough to have been there prior to that time.

Confirmed adverse effects of dredging on *Lampsilis higginsi,* the study reported, were found only at Prairie du Chien, where 21 specimens had been lost in dredging operations, and on the Mississippi at Brownsville (Minnesota), where one juvenile specimen had been located.

But the study cautioned that, unless care was exercised in the removal of materials from the channel and In Its deposition on spoil banks along the river, mussels could be adversely affected. The potential impacts include direct destruction of the animals by the dredges' cutterheads and subsequent transport through pipes to a new location; the burial of mussels under dredged deposits; and, increased turbidity and pollution through the resuspension of heavy metals and other

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Great River Studies Striving To Conserve Fish and Wildlife

Preservation of endangered freshwater mussels is one of many concerns of the Great River Environmental Action Team (GREAT)—a Federal/state interagency body that is performing intensive studies of the upper Mississippi River.

GREAT was created in 1974 under the auspices of the Upper Mississippi River Basin Commission to investigate environmental concerns arising out of the dredging and maintenance of the 9-foot navigational channel by the U.S. Army Corps of Engineers from New Orleans to Minneapolis–St. Paul. Approximately 1 million cubic yards of sediment are removed from the river system annually and deposited in shallow backwater areas, on natural islands, or on spoil banks along the river.

Numerous wing dams have been constructed by the Corps at right angles to the river to control water flow. There also has been a considerable amount of construction and dredging by private interests.

These manmade changes have greatly altered the character of the river since 1924, when Congress proclaimed "navigation" as the river's primary purpose. That same year, Congress also established the Upper Mississippi River Wild Life and Fish Refuge, near Wabasha, Minnesota, but stipulated that operation of the 195,000-acre refuge was not to interfere with the operation of the 9-foot navigational channel.

Over the years, however, conservation organizations, officials of states adjoining the river, biologists, and interested individuals have become increasingly concerned about the river's alteration. Their campaign to give equal attention to such other aspects as fish and wildlife, recreation, wilderness areas, water quality, and flood plain management has led to the formation of GREAT.

The interagency team is made up of appointed representatives from the States of Wisconsin, Minnesota, Illinois, Missouri, and Iowa. The five Federal agency members are the Fish and Wildlife Service, the Corps of Engineers, the Department of Agriculture's Soil Conservation Service, the Environmental Protection Agency, and the U.S. Coast Guard.

Congress has appropriated nearly $10 million for a series of studies by GREAT from fiscal year 1975 through fiscal year 1979. These studies have been broken down geographically into three phases and cover every aspect of the river system's resources and management. GREAT I extends from Minneapolis–St. Paul south to Guttenberg, Iowa; GREAT II stretches from Guttenberg to Saverton, Missouri; and GREAT III covers the system from Saverton to the mouth of the Ohio River at Cairo, Illinois.

The main stem of the Mississippi, which drains 1.5 million square miles of land covering 31 states and two Canadian provinces, is the largest environmental "corridor" in the United States sustaining abundant fish and wildlife resources. But GREAT studies are showing that the biological productivity of the upper Mississippi is being threatened in a number of ways.

Continuing sedimentation is filling lakes, marshes, and backwaters. The disposal of dredged materials in some instances has resulted in the conversion of productive fish and wildlife habitat into relatively sterile open sand areas. Some backwaters created by the construction of dams and the diking effect of spoil banks formerly provided rich habitat for mammals, fish, and waterfowl. But now many of these same areas appear to be dying for lack of fresh water and for other complex ecological reasons.

It is disturbing problems like these, along with the conservation of fish and wildlife resources in the river's mainstream, that the GREAT studies are striving to correct before it is too late.

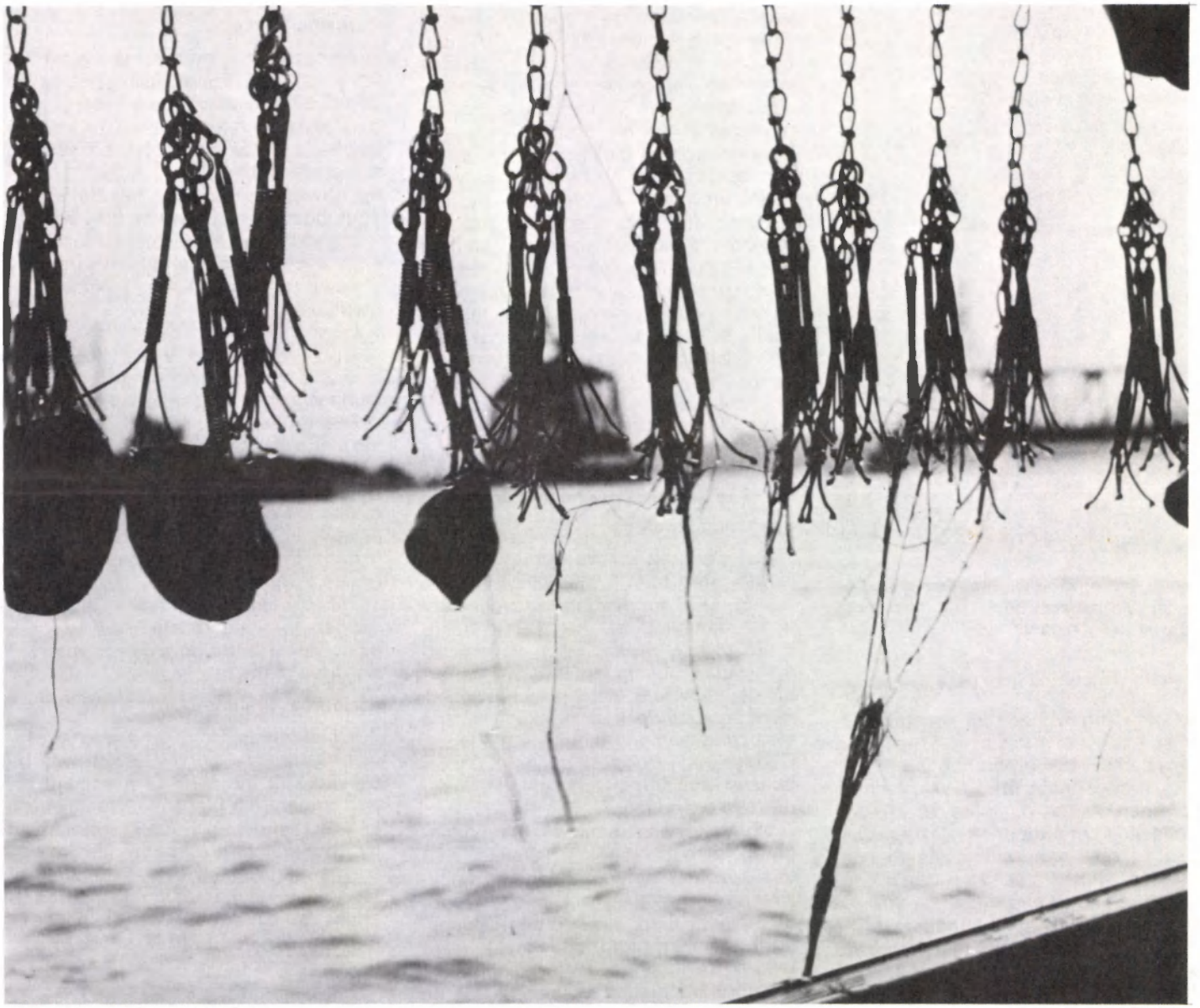

Photo by Dona Finnley

This sampling of freshwater mussels was pulled from the St. Croix River by Samuel Fuller just below the Hudson (Wisconsin) railroad bridge (in background), where he previously found six Endangered Higgins' eye pearly mussels. The mussels are clinging to a device known as a brail, which Fuller's crew has used extensively in its survey of dredging sites along the upper Mississippi River navigational channel for the U.S. Army Corps of Engineers.

The brail consists of a 10-foot wooden bar equipped with a number of 10-inch chains from which are suspended bunches of hooks. The hooks are straight wire tines of different gauges (to accommodate various sizes of mussels) tipped with balls of solder. The bar is designed to float above the riverbed while towed from a small boat, allowing the hooks to graze the bottom. As a hook passes between the open valves of a mussel, the animal clamps shut on it and is pulled along by the motion of the brail and boat.

In Fuller's brailing runs, the device is towed downstream for five minutes, then lifted into the boat so that specimens can be removed. Several 5-minute runs covering about 500 feet are made at each survey site, generally about 50 feet from the shoreline.

Mussels also are retrieved in the survey by pollywogging—wading offshore and collecting by hand; by scooping them up in a wire mesh box called a Needham scraper (useful for finding juveniles too small to be caught by brailing); and by hard-hat HOOKAH diving. The latter technique permits the visual examination of suspected endangered mussel beds without disturbing them.

Mussels (continued from page 4)

toxic materials when the river bottom is disturbed.

Turbidity reduces light penetration, decreasing the productivity of microorganisms upon which mussels feed, according to Fuller. Associated suspension of fine particles also may interfere with the animals' feeding and respiration by clogging their gills.

(Under agreement with the Minnesota Pollution Control Agency, the Corps is now studying the effects of turbidity, in terms of duration and extent of dissipation, and is attempting to determine the degree and nature of chemical pollutants resuspended during dredging.)

Project investigators also noted that backwater areas created by spoil deposits since 1924, when Congress authorized maintenance of the navigational channel, serve as prime nursery

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Photo by Dona Finnley

Daniel J. Bereza, assisting Sam Fuller in the survey project, holds two specimens believed to be Higgins' eyes

Mussels (continued from page 5)

and breeding grounds for several mussel species and their host fishes, and may need special protection.

Restrictive state laws now preclude the open water dumping of dredge spoils along the upper Mississippi. Disposal is now generally made in consultation with states and other concerned agencies and organizations. Although so-called spoil islands are the primary dump sites, spoil is often used as landfill, for sanding icy roads, or as blacktopping.

Siltation Study

Another study—performed in 1977 by the Service under contract with the Corps—indicates mussels are capable of surviving burial under dredged silt to some degree.* Researchers demonstrated this by burying fat mucket (*Lampsilis radiata luteola*) and pocketbook (*L. ventricosa*) clams in sediment from 2 to 10 inches in depth. They found that 7 inches or more of sand or silt was required to prevent the emergence of the two species, while 4 inches of silt was sufficient to kill 50 percent of the smaller pigtoe (*Fusconaia flava*) clams.

Declining Populations

The Fuller study reveals that all species of mussels have suffered a decline in abundance in the upper Mississippi River over the past 75 years. (An exception is the mapleleaf—*Quadrula quadrula*—which has apparently managed to flourish by exploiting the impounded backwater areas.) There was no evidence of mussels in the lower Minnesota River, where they were abundant in the late 19th century.

Fuller attributes the sharp drop in numbers of several species, including the Higgins' eye, partly to excessive commercial exploitation by the pearl button industry, which used mussel shells to make buttons around 1900.

Probably all mussels have been affected by water quality degradation from municipal and industrial wastes, pesticide runoff, and increased siltation. Dredging and disposal of riverbed material by private companies was listed as another adverse factor.

Specimen Findings

Fuller's crew of 16 surveyors collected more than 8,500 living mussels during 1977, providing a cross-sectional sampling of the river's freshwater mussel fauna. From their scarcity, Fuller concluded that an "unfortunate number" of mussel species were in decline and probably facing extinction—among them the buckhorn (*Tritogonia verrucosa*), bullhead (*Plethobasus cyphyus*), and elephant ear (*Elliptio crassidens*).

No trace was found of the Endangered fat pocketbook. The study said this species "may linger in the backwaters, but its presence in the Upper Mississippi River in 1977 was in question." Similarly, no specimens were located of the rare narrow papershell (*Leptodea leptodon*)—also called the scale pearly mussel— and salamander mussel (*Simpsoniconcha ambigua*). The status of the narrow papershell is under review for possible listing under the Endangered Species Act.

Another rare species, the spectacle case mussel (*Cumberlandia monodata*), was discovered at two sites. This species apparently can live in wing dams that have been built at right angles to the shore to control the flow of the river.

Exotic Intruder

The study discovered the presence of an exotic species—the Asiatic clam (*Corbicula manilensis*)—in . the St. Croix River. The species is known to dislodge mussels from the streambed, uprooting them to their eventual death. Fuller said if the Asiatic clam becomes established in the beds where the Higgins' eyes are located and elsewhere, it could pose as big a threat to the mussel population as any of the other adverse factors.

Parasitic Phase

An associated problem is the availability of the proper fish species to serve as glochidial hosts. Many species of freshwater mussels reproduce by the male shedding his sperm into the current; the sperm is then picked up downstream by the female whose eggs become fertilized as they are extruded from the oviducts. The fertilized eggs are held in the gills, where they develop into larval forms known as glochidia.

In some genera, the glochidia develop into juveniles while still in the mussel's gills. But in others, such as *Lampsilis,* the glochidia attach themselves to the gills and body of a passing fish. The larval bivalve then soon becomes covered by fish tissue, which forms a cyst or capsule. After its metamorphosis in this parasitic stage, a juvenile mussel then drops from the fish to the stream bottom, where it grows to adulthood.

Fuller believes further research is needed into the glochidiosis process as no larval hosts have been identified for three of the rare mussels.

Biological Opinion Due

Additional information gathered during this year's survey effort will be available in the form of a second report around the first of the year. These and related data will then be employed by the Service in preparing its biological opinion on the overall impacts of the Corps' channel maintenance operations, which the Service expects to issue by early spring.

Photo by Dona Finnley

Samuel L. H. Fuller, the malacologist selected by the Corps to lead its survey effort, examines a pigtoe mussel

* Leif L. Marking and Terry D. Bills, "Acute Effects of Silt and Sand Sedimentation on Freshwater Mussels," FWS Fish Control Laboratory at La Crosse, Wis., 1977.

Rulemaking Actions—August 1978

Whooping Crane

To help provide additional Federal protection for the Endangered whooping crane (*Grus americana*) during its spring and fall migrations, the Service has proposed designating eight stopover areas along the flyway as Critical Habitat for the species (F.R. 8/17/78).

If finally approved, these areas would be added to the five that were designated as Critical Habitat for the primary flock on May 15, 1978 (see June 1978 BULLETIN), with all thirteen areas in the central flyway providing protected overnight roosting sites and feeding stations for the whooper population of about 70 birds on its long flight between Wood Buffalo National Park, in Canada's Northwest Territories, and Aransas National Wildlife Refuge, on the gulf coast in Texas.

Proposed Areas

The eight areas proposed as additional Critical Habitat are as follows:

1. Kirwin National Wildlife Refuge, in Phillips County, north-central Kansas. Centered on the Kirwin Reservoir on the north fork of the Solomon River, the refuge provides the crane with extensive flats and freshwater marshes.

2. Medicine Lake National Wildlife Refuge, in Roosevelt and Sheridan Counties, northeastern Montana. The refuge includes a manmade impoundment, plus sinks and potholes, that together provide an extensive and relatively isolated wetland environment for the migrating cranes.

3. An area along the Niobrara River, in Brown, Keya Paha, and Rock Counties, north-central Nebraska, to include extensive sand bars, shallow waters, and adjacent marshes.

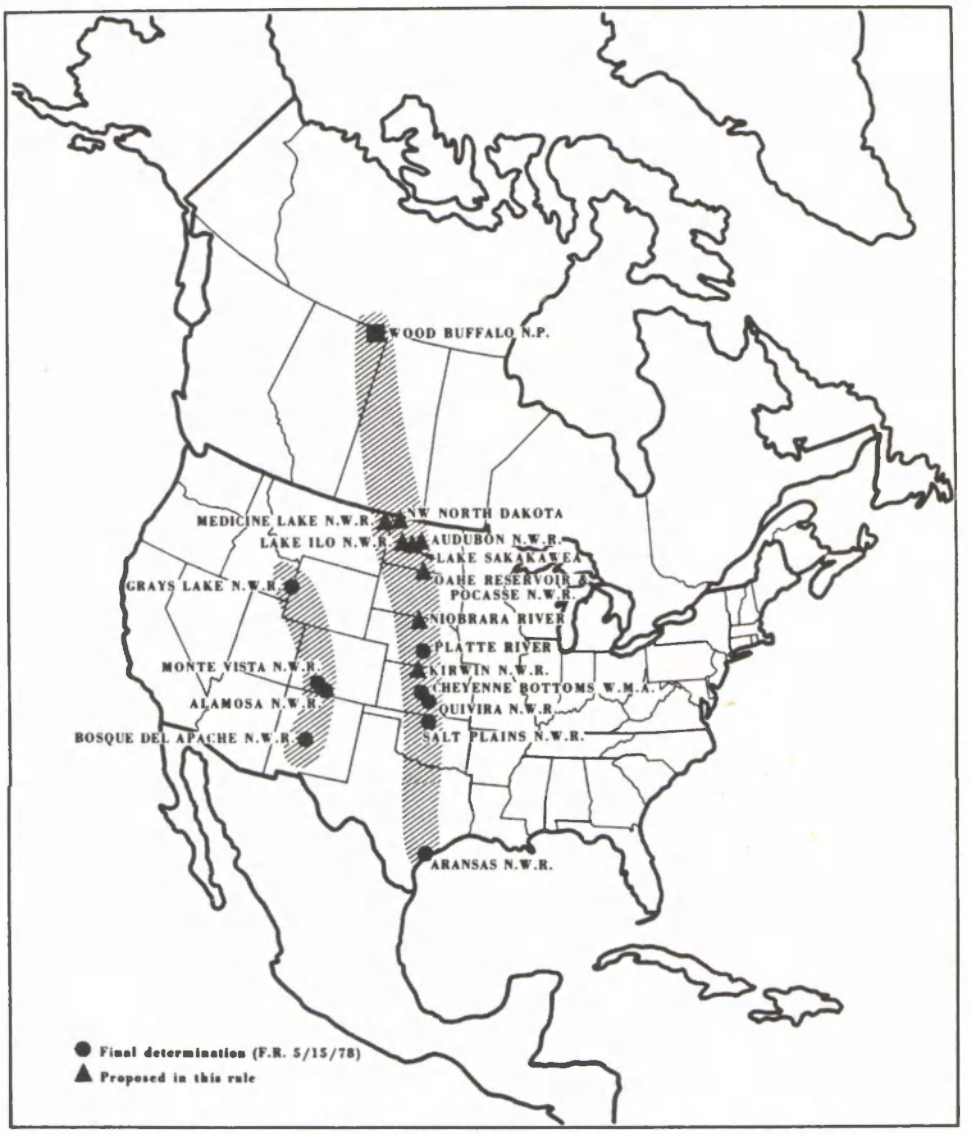
4. An area in Burke, Divide, Mountrail, Renville, Ward, and Williams Counties, northwestern North Dakota. This relatively isolated wetland and prairie environment includes potholes, sinks, ponds, and streams.

5 Lake Sakakawea in Dunn, McKenzie, McLean, Mountrail, Ward, and Williams Counties, northwestern North Dakota. This lake area includes Lake Sakakawea (the reservoir behind Garrison Dam on the Missouri River), the dam itself, and Audubon National Wildlife Refuge; it provides a relatively isolated environment with extensive shallows and gravel islands.

6. Lake Ilo National Wildlife Refuge, in Dunn County, western North Dakota. Prairie potholes, sinks, and streams characterize this small stopover area to the south of Lake Sakakawea.

7. Oahe Reservoir area, in Burleigh, Emmons, Morton, and Sioux Counties, south-central North Dakota. This extensive area includes the waters of the North Dakota portion of the reservoir, which is an impoundment behind Oahe Dam on the Missouri River. With its potential for extensive stretches of shallow water and numerous gravel islands, the area provides the migrating cranes with many roosting and feeding sites, particularly during periods of drought.

8. Oahe Reservoir area, in Campbell, Corson, Dewey, Haakon, Hughes, Potter, Stanley, Sully, Walworth, and Ziebach Counties, north-central South Dakota. This area, which includes Oahe Dam and the Pocasse National Wildlife Refuge, constitutes the South Dakota portion of the Oahe Reservoir area.



Eight additional stopover areas are proposed as Critical Habitat for the whooping crane to protect the primary flock's feeding and roosting sites along the central flyway

Critical Habitat in North Dakota

In issuing its recommendations for Critical Habitat, the Service emphasizes the importance of including the three proposed areas in northwestern and western North Dakota, in that these areas constitute the last stopover for the cranes on their spring migration northwards to nest in Wood Buffalo National Park. As the Service points out, "If the cranes were to be deprived of their feeding grounds in North Dakota [and adjacent southern Canada] and were to arrive at the park during one of the common spring snow storms, they might die of malnutrition or reabsorb their egg material for nourishment, thereby reducing the likelihood of reproductive success."

Inclusion of Dams

Manmade structures are customarily excluded from Critical Habitats. This proposal is unusual, therefore, in that it specifically includes two such structures—Garrison Dam and Oahe Dam. Their inclusion is based on the knowledge that their existence has led to the formation of reservoirs that, in some

(continued on next page)

Rulemakings (continued)

Whooping Crane (continued from page 7)

years, help provide habitats suitable for the whooping crane's stopovers.

(These reservoirs become particularly important in drought years, when most natural wetlands in the area become dry. Then the lowered reservoirs provide a reserve of bars and shallow islands that can be used by the cranes and other waterbirds.)

The Service notes that, if finally approved, the proposed rulemaking will not interfere with the routine operations of the two dams.

Comments Due

In issuing the rulemaking, the Service set a November 15 deadline for the Governors of Kansas, Montana, Nebraska, North Dakota, and South Dakota to submit comments on the proposal and an October 15 deadline for the public. Subsequently, the Service extended the due date for public comments to November 15.

More Protection Sought by Service For Desert Tortoise

Rapidly mounting evidence that the desert tortoise (*Gopherus agassizii*) is declining throughout much of its range in the Southwestern United States has prompted the Service to take two actions to further conservation of the species:

- The Beaver Dam Slope tortoise population in southwestern Utah, which has fallen from 2,000 to fewer than 350 individuals, has been proposed for Endangered status (F.R. 8/23/78). The proposed rulemaking also defines a 38-square-mile area as Critical Habitat for this population.
- A status review has been initiated for the desert tortoise throughout its known range in California, Nevada, Utah, Arizona, and adjacent areas of Mexico, including the state of Sonora, to determine whether the species should be proposed for listing as an Endangered or Threatened species (F.R. 8/23/78.)

Comments from the public on the proposal to list the Beaver Dam Slope population should be submitted to the Service no later than October 23, 1978. The Governor of Utah has until November 22, 1978, to make his views known to the Service.

Comments are being solicited from the governors of the four States involved in the tortoise status review and other interested parties. They are due by November 22, 1978.

Habitat Destruction

The tortoise generally appears to be in trouble because of livestock overgrazing, which has reduced forage available to the tortoise, and because of habitat destruction resulting from agricultural and off-road vehicle (ORV) use. In addition, some populations are reportedly being harmed by overcollection and by maiming and killing, especially along highways.

In the case of the Beaver Dam Slope population, the Service said the primary adverse factor was overgrazing by cattle, which had reduced perennial grasses and destroyed vegetation, especially the creosote bush, around which tortoises construct their burrows. Cattle also may cave in burrows, harming young tortoises.

The proposed rulemaking is based upon a petition submitted by the Desert Tortoise Council in August 1977, plus a review of the scientific literature and reports from the Bureau of Land Management. The Service has noted that, if the estimated 5.5 percent annual rate of decline were to continue for 40 years, only 40 tortoises would be left of the fewer than 350 presently remaining. Most of the population consists of adults, many of them quite old, including some that were marked in a study conducted from 1936 to 1946.

The proposed Critical Habitat lies in Washington County, which borders the Nevada and Arizona state lines.

Photo by C. Kenneth Dodd, Jr.

Desert tortoise on Beaver Dam Slope

Utah Objection

Donald A. Smith, former director of the Utah Division of Wildlife Resources, has indicated the State would object to listing the Beaver Dam Slope population at the present time. He has expressed concern that listing would be used to eliminate or drastically reduce grazing and provide legal arguments against grazing adjustments.

State Protection

In launching the status review of the entire species, the Service noted that all the States in which it is found presently protect the reptile. The Service said it recognized these efforts but nonetheless feels that a comprehensive review of the species' status throughout its range is warranted.

Three Texas Fishes

To help provide Federal protection for three species of fish found only in southwestern Texas, the Service has proposed Endangered status for the Leon Springs pupfish (*Cyprinodon bovinus*) and Goodenough gambusia (*Gambusia amistadensis*) and Threatened status for the Devil's River minnow (*Dionda diaboli*), as well as Critical Habitat for the pupfish and minnow (F.R. 8/15/78).

All three species have declined in recent years as a result of adverse habitat modification. In fact, the gambusia's original habitat has been totally destroyed by a reservoir development and the fish survives only in capitivity.

Leon Springs Pupfish

Formerly, the pupfish was known to occur in Leon Springs, Diamond Y Spring, and the latter spring's outflow stream, Leon Creek. All three bodies of water are located in Pecos County, north and west of Fort Stockton.

Excessive removal of ground water in the area greatly reduced stream flows. Leon Springs dried up in 1962, thereby extirpating the pupfish population, and subsequently, the upper portion of Leon Creek dried up. At present, reduced stream flows also threaten the remaining pupfish populations in the lower portion of the creek and in Diamond Y Spring.

In 1974, an additional threat to the species was discovered: hybridization with an introduced pupfish, *C. variegatus,* in the lower part of the creek. In March 1978, hybrids were also found in Diamond Y Spring. Efforts are now being made to eliminate both the hybrid and introduced pupfishes. In addition, pure Leon Springs pupfishes are being held at Dexter National Fish Hatchery.

Diamond Y Spring and Leon Creek, which provide sufficient space, food, and cover to sustain a viable Leon Springs pupfish population, have been proposed as Critical Habitat for the species.

Goodenough Gambusia

The original habitat of the Goodenough gambusia consisted solely of Goodenough Spring, located near the Rio Grande in Val Verde County. Completion of the Amistad Dam on the Rio Grande in the late 1960's eventually resulted in the flooding of the Goodenough Spring area. When the reservoir reached full pool level, the spring was under more than 70 feet of silt-laden water and no evidence could be found of the gambusia population.

At present, the only known populations of the Goodenough gambusia are those being maintained at the University of Texas and Dexter National Fish Hatchery.

(continued on next page)

Rulemakings (continued)

Fishes (continued from page 8)

The Service hopes that eventually it will be possible to reestablish the species in the wild.

Devil's River Minnow

The former range of the Devil's River minnow consisted of several streams and springs located near the Rio Grande in Val Verde County. In recent years, however, that range has been greatly reduced by habitat alteration.

The filling of Amistad Reservoir flooded the lower portion of the Devil's River, destroying the local Devil's River minnow population. Ground water removal led to extirpation of the population in the river's headwaters, and also reduced Pecan Springs—which had originally consisted of at least six springs—to one flowing spring.

At present, reduced stream and spring flows resulting from ground water removal pose a threat to the survival of the remaining populations in the Devil's River and in Pecan Springs and its outflow stream. In addition, urbanization threatens the populations in San Felipe Creek, San Filipe Springs, and several short spring runs, all of which lie in or near the city of Del Rio.

All of these areas have been proposed by the Service as Critical Habitat for the species.

Comments Due

The public's comments on this proposed rulemaking should be submitted no later than October 13, 1978; comments from the Governor of Texas are due by November 12, 1978.

Virgin River Chub

Under a proposed rulemaking issued by the Service, the Virgin River chub (*Gila robusta seminuda*) would be listed as Endangered and portions of the river flowing through Utah, Arizona, and Nevada would be identified as Critical Habitat (F.R. 8/23/78).

The chub is endemic to a 125-mile-long section of the Virgin River extending from below La Verkin Springs, Utah, downstream to the backwaters of Lake Mead, Nevada. However, more than 50 percent of this section of the river flows intermittently (the result of water diversion for agriculture), and water quality in several portions may not be suitable to sustain the fish. These factors, plus flooding from Lake Mead, have reduced populations of the chub—once the top carnivore in the river's ecosystem—as has increased predation by such introduced exotic species as the green sunfish, largemouth bass, and red shiner.

The Service said the chub's habitat is being further threatened by reduced flows of the river from the proposed Warner Valley project. In addition, the Bureau of Reclamation's proposed desalinization project at La Verkin Springs could adversely affect the chub's habitat.

"Any additional loss of flow or alteration of habitat in the Virgin River may result in the extinction of this species," the Service said.

Critical Habitat for the species would include the river's main channel from La Verkin Springs to the Lake Mead backwaters.

Comments on the proposal should be submitted to the Service no later than November 22, 1978.

New Mexican Ridge-Nosed Rattlesnake

In a final rulemaking issued by the Service, the New Mexican ridge-nosed rattlesnake (*Crotalus willardi obscurus*) has been listed as Threatened and its known range in southwestern New Mexico has been designated as Critical Habitat (F.R. 8/4/78).

The ruling, effective August 21, emphasizes that Federal protection is needed to help reduce illegal collection of this rare subspecies. Critical Habitat for the snake is identified as "an area between 6,200 feet and 8,532 feet in Bear, Indian, and Spring Canyons, Animas Mountains."

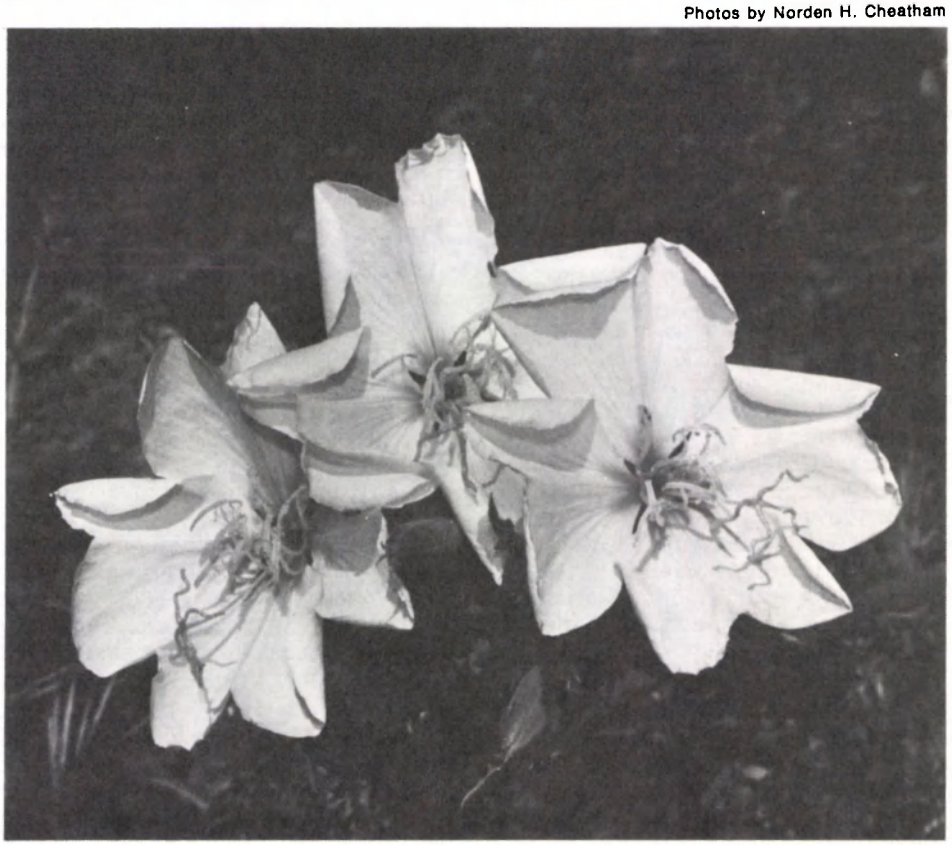
(continued on next page)

Calif. Plants (continued from page 1)

The Service said that any further loss of habitat would appreciably decrease the likelihood of the survival and recovery of these two endemic plants.

A total of six comments were received on the proposal following publication in the *Federal Register* on February 8, 1977. All of those respondents who commented on the biological aspects of the proposal favored Critical Habitat determination.

Photos by Norden H. Cheatham



The Contra Costa wallflower (right) and Antioch Dunes evening primrose (below) survive only on California's Antioch Dunes, now protected as Critical Habitat

Snake (continued from page 9)

(The subspecies' only other known location is an area in the Sierra de San Luis, in the adjoining Mexican state of Chihuahua.)

The final rulemaking differs from the proposed rulemaking in that it provides for Threatened rather than Endangered status and includes a more precise definition of Critical Habitat.

These changes were made principally on the basis of comments and other information received by the Service from the New Mexico Department of Game and Fish and 11 other respondents following publication of the proposal in the *Federal Register* on May 26, 1977 (see June 1977 BULLETIN).

Comments on Proposal

The State game and fish department, which recommended Threatened status, noted that the snake is already listed as endangered by the State and that it may be somewhat more widespread than indicated in the original proposal; the department suggested addition of a third canyon to the Service's proposed delineation of Critical Habitat and indicated that a fourth one may also have a subspecies population. In addition, the department took note of the conservation efforts of a local cattle company that owns much of the area proposed as Critical Habitat.

The company itself opposed the Service's proposal, claiming that existing State laws and the company's private efforts (including controlling access to the canyons and limiting development within the area) already provide the rattlesnake with adequate protection.

Herbert S. Harris (Natural History Society of Maryland), who had previously written a major study of the snake, recommended refining the proposal's generalized identification of Critical Habitat, which had been given simply as all elevations in the Animas Mountains above 6,200 feet.

In issuing its final ruling, the Service concluded that the subspecies should not be listed as Endangered, because "the plight of this unique rattlesnake has been recognized by the State and the landowners have made a vigorous attempt to discourage collectors and associated habitat destruction." Nevertheless, it warrants Threatened status in that "the high price commanded by the . . . [snake] still makes it a very desirable animal, and attempts to secure specimens can probably be expected in spite of strict control."

In addition, the Service adopted the Critical Habitat modification suggested by both Herbert Harris and the State game and fish department.

Ten North American Beetles

Andrew's dune scarab beetle Photo by A. Hardy

The Service has proposed the listing of two North American beetles as Endangered and eight as Threatened, and the determination of Critical Habitat for all ten species and subspecies (F.R. 8/10/78).

Native to three Western States and adjoining portions of Canada and Mexico, the beetles have been proposed for protection under the Endangered Species Act of 1973 because their population levels have been declining and their habitats were and/or are undergoing adverse modification.

Proposed as Endangered

The following two beetles have been proposed for Endangered listing:

Beller's ground beetle (*Agonum belleri*). The known range of this beetle is limited to a few lowland sphagnum (peat) bogs in the State of Washington and in British Columbia. In Washington, the beetle was formerly found in Chase Lake Bog (Snohomish County) and Kings Lake Bog (King County). However, habitat alteration resulting from peat mining and housing development has eliminated the Chase Lake Bog population. Kings Lake Bog—now the only known locality in the United States for this beetle—has been proposed as Critical Habitat.

Mojave rabbitbrush longhorn beetle (*Crossidius mojavensis mojavensis*). Habitat alteration has reduced the range of this beetle, in southern California, from five locations in Los Angeles and Kern Counties to one site near Lancaster, in Los Angeles County. Recommended for designation as Critical Habitat, this small area contains *Chrysathamnus nauseosus gnaphalodes* and *C. n. mojavensis,* which serve as essential host plants for the beetle.

Proposed as Threatened

The following eight beetles have been proposed for Threatened listing:

Sacramento anthicid beetle (*Anthicus sacramento*). This species is found only at two sand dune sites along the Sacramento River in central California. One site, on Grand Island (Sacramento County), currently serves as a garbage dump; the other site, near Rio Vista (Solano County), is subject to heavy off-road vehicle traffic. These uses are adversely modifying the beetle's natural habitat. Both sites have been identified as essential to the survival of the species.

Globose dune beetle (*Coelus globosus*). Formerly, this beetle was common in low beach foredunes along the Pacific coast from central to southern California, as well as in Baja California, Mexico. At present, though, the localities of occurrence are relatively few and the species' numbers are limited.

The principal cause of this decline is destruction of the natural foredune vegetation resulting from recreational development, human traffic on the

(continued on next page)

Beetles (continued from page 10)

dunes, and the introduction of European dune grass (which is incompatible with the beetle's needs).

As proposed by the Service, Critical Habitat for the globose dune beetle consists of eight coastal sites in Mendocino, Sonoma, Marin, San Mateo, Monterey, Ventura, and San Diego Counties.

San Joaquin dune beetle (*Coelus gracilis).* The known range of this species now consists of only four sites, all located along the western edge of the San Joaquin Valley in central California. (The population at a fifth site, in the Antioch Dunes in Contra Costa County, has already been extirpated as a result of habitat alteration.)

Two of the remaining sites, in Fresno and San Benito Counties, are very vulnerable to habitat damage in that each of them is only a few hundred square meters in area. The other two sites, in Fresno and Kings Counties, are already being subjected to habitat alteration as a result of off-road motorcycle usage.

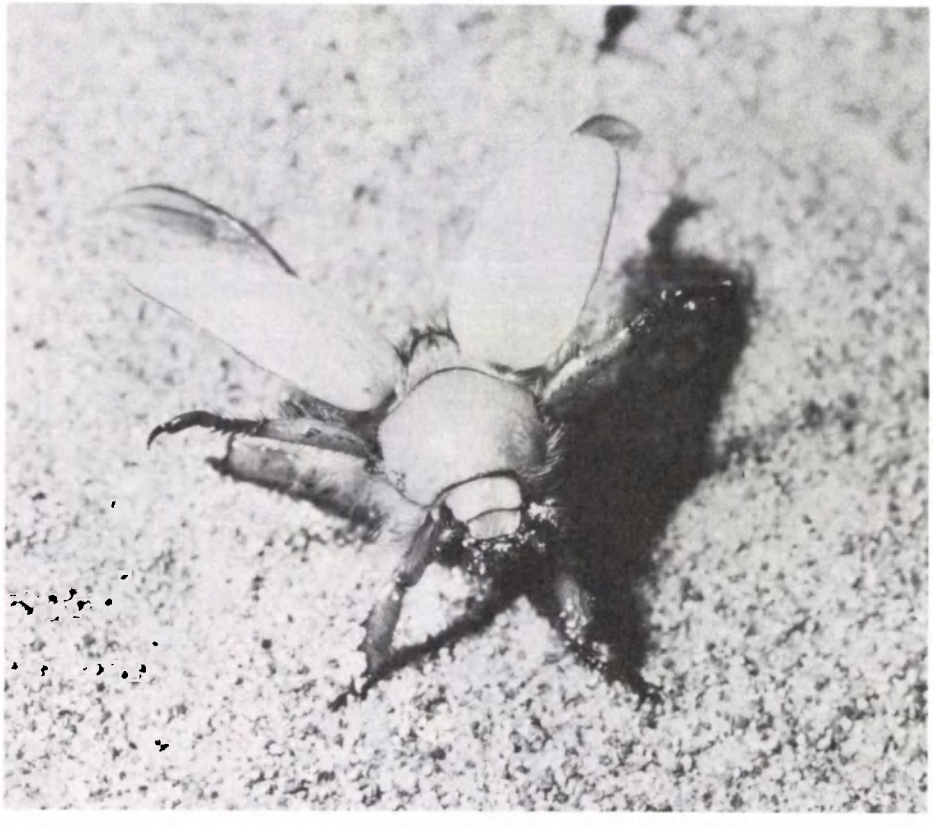
The Service has recommended designating all four sites as Critical Habitat for the San Joaquin dune beetle.

California elderberry longhorn beetle (*Desmocerus californieus dimorphus*). This beetle formerly occurred in elderberry thickets in oak woodlands along the Sacramento and San Joaquin rivers and their tributaries in central California. However, agricultural activities, levee construction, and stream channelization have destroyed much of the beetle's natural habitat. In addition, the clearing of underbrush (including elderberry bushes) and the planting of lawns in some State and county parks have further reduced the insect's range.

The beetle is now limited to fewer than ten localities, and two of these—Goethe Park, along the American River in Sacramento County, and an area along Putah Creek, in Solano County—have been proposed as Critical Habitat.

Delta green ground beetle (*Elaphrus viridis*). Rediscovered in 1974, almost a century after it was first collected, the delta green ground beetle is limited to the edges of two vernal pools in Solano County in central California. These pool areas, which could be destroyed by agricultural activities or drainage projects, have been proposed as Critical Habitat for the species.

Robinson's rain scarab beetle (*Phobetus robinsoni*). This species' known range consists of no more than three localities in San Diego and Orange Counties, in southern California. It is believed that recreational and housing development may have already extirpated the beetle population at O'Neill Park, in Orange County. Housing development also threatens the population near Laguna Beach, in Orange County (the area proposed for Critical Habitat designation). Only the Scissor's Crossing (San Diego County) population remains unthreatened at present.



Giuliani's dune scarab beetle

Photo by Fred G. Andrews

Andrew's dune scarab beetle (*Pseudocotalpa andrewsi*). This beetle is found only in the Glamis Dunes, or Imperial Sand Hills, located in Imperial County in southeastern California. It has a specialized habitat, consisting of troughs of loose, drifting sand set between the dunes. In its immature stages, the beetle feeds on dead organic matter in the troughs. Off-road vehicles traversing the troughs prevent the accumulation of such organic matter and thereby threaten the survival of the beetle. The Service has proposed the Gamis Dunes as Critical Habitat for the species.

Giuliani's dune scarab beetle (*Pseudocotalpa giulianii*). The only known population of this beetle lives on Big Dune, which is located in Nye County in southern Nevada. The beetle's larval stage feeds on dead organic matter that accumulates on the dune slopes. However, this matter tends to be either compacted or dispersed by the passage of off-road vehicles. Big Dune has been proposed as Critical Habitat for the species.

Comments Due

Comments from the public on this proposal should reach the Service by October 8, 1978; comments from the Governors of California, Nevada, and Washington should be submitted by November 7, 1978.

Puerto Rico (continued from page 2)

Research Projects

Puerto Rico is engaged in a cooperative project with the Fish and Wildlife Service and U.S. Forest Service to monitor the population of the Puerto Rican plain pigeon, using a simultaneous station census method. The study indicates that less than 100 of the pigeons remain. (A Service-appointed recovery team recently completed its draft recovery plan for this Endangered species.)

In other research projects, the department has determined that only a small remnant population remains of the white-crowned pigeon (*Columba elucocephala*), which has been listed as endangered by the Commonwealth. The bird's decline is attributed to habitat loss and overhunting. As a management measure, the department has postponed the pigeon and dove hunting season to protect late nesting by the white-crowned pigeon.

A preliminary survey of the manatee (*Trichechus manatus*) indicates that a small breeding population ranges through the coastal waters of southeastern Puerto Rico and Viegues Island (which is under Commonwealth jurisdiction). A proposed distribution and abundance study is awaiting funding by the Service.

Pending Rulemakings

The Service expects to issue rulemakings and notices of review on the subjects listed below during the next 90 days. The status or action being considered for each final and proposed rulemaking is given in parentheses.

The decision on each final rulemaking will depend upon completion of the analysis of comments received and/or new data made available, with the understanding that such analysis may result in modification of the content or timing of the original proposal, or the rendering of a negative decision.

Pending Final Rulemakings

- 6 butterflies (C.H.)
- Grizzly bear (C.H.)
- 13 crustaceans (E, T)
- Black toad (T, C.H.)
- 2 zebras (T)
- 12 Western snails (T)
- 2 big-eared bats (E)
- 3 Ash Meadows plants (E)
- 5 plants (E)
- 6 San Francisco Bay Area plants (E, T)
- Leatherback sea turtle (C.H.)
- 2 North Carolina plants (E, T)
- 2 cacti in Colorado and Utah (E)
- Dinosaur milk-vetch in Utah (E)
- 2 Hawaiian cave arthropods (E, T, C.H.)
- Prairie milkweed (E)
- Carter panicgrass (E)
- Large-fruited bladderpod (E)

Pending Proposed Rulemakings

- 2 harvestmen (E, T)
- 3 mussels (C.H.)
- Rocky Mountain peregrine falcon population (C.H.)
- Colorado squawfish (C.H.)
- Unarmored threespined stickleback (C.H.)
- Puerto Rican whip-poor-will (C.H.)
- Laysan duck (C.H.)
- Whip-scorpion (E, C.H.)
- 2 plants (E) and 6 plants (C.H.)
- 20 Appendix I spp.
- Cui-ui (C.H.)
- Bolson tortoise (E)
- Coachella Valley fringe-toed lizard (T, C.H.)
- 7 Oregon freshwater fishes (E, T, C.H.)
- Valdina Farms salamander and isopod (E, C.H.)
- Light-footed clapper rail and California least tern (C.H.)
- Yellow-shouldered blackbird (C.H.)
- Virginia fishes (T, C.H.)
- Leopard (reclassification to T)
- 4 Yaqui River fishes (E, C.H.)
- Southeastern fishes (E, T, C.H.)
- Green sea turtle (C.H.)
- Gray bat (C.H.)
- Columbian white-tailed deer and Sonoran pronghorn (C.H.)
- Warner sucker, Oregon (E, C.H.)
- 4 fishes in Kansas, Missouri, and Arkansas (T, C.H.)
- Hawaiian tree snails (E, C.H.)

Abbreviations: E=Endangered
T=Threatened
C.H.=Critical Habitat

BOX SCORE OF SPECIES LISTINGS

Category	Number of Endangered Species			Number of Threatened Species		
	U.S.	Foreign	Total	U.S.	Foreign	Total
Mammals	33	227	260	3	18	21
Birds	67	144	211	3		3
Reptiles	11	47	58	10		10
Amphibians	5	9	14	2		2
Fishes	29	10	39	12		12
Snails	2	1	3	5		5
Clams	23	2	25			
Crustaceans	1		1			
Insects	6		6	2		2
Plants	15		15	2		2
Total	192	440	632	39	18	57

Number of species currently proposed: 156 animals
1,850 plants (approx.)
Number of Critical Habitats proposed: 72
Number of Critical Habitats listed: 32
Number of Recovery Teams appointed: 64
Number of Recovery Plans approved: 18
Number of Cooperative Agreements signed with States: 22

August 31, 1978

Northern States Bald Eagle Recovery Team Appointed

James Grier of North Dakota State University has been named leader of the Northern States Bald Eagle Recovery Team.

Other members of the team appointed in August include Francis J. Gramlich of Augusta (Maine), Jim Mattsson of Bemidji (Minnesota), and James Elder of Twin Cities (Minnesota), all U.S. Fish and Wildlife Service officials; John Mathisen of the U.S. Forest Service (Cass Lake, Minnesota); and Joel Kussman of the National Park Service (Denver, Colorado).

ENDANGERED SPECIES TECHNICAL BULLETIN

Department of the Interior • U.S. Fish and Wildlife Service • Endangered Species Program, Washington, D.C. 20240

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